

CHAPTER III

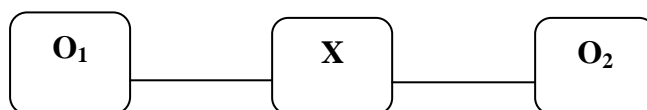
RESERACH METHODOLOGY

This chapter consists of : research type, research design, variable of the study, population and sample, research instruments of the study, data collection procedure and data analysis procedure.

A. Research Type

This study uses the quantitative research design which makes use of numbers and statistical data to analyze and present the results. The writer investigated how the cause which would be an independent variable (in this study the use of using picture crossword) affected the dependent variable (learning vocabulary). Experimental design was used because the writer has to draw the cause-effect relationship between the dependent and independent variables.

The type of study used is Experimental Study. It utilizes One group pre-Test/Post-Test Design. Creswell stated that this design includes a pre-test measure followed by a treatment and a post test for a single Group.¹ This Design Can be diagrammed as follows :



Where:

O₁ : Pre-test

X : Treatment

¹John W. Creswell, *Qualitative And Quantitative Approach* (California: SAGE Publications, inc,1994), P.132.

O₂ : Post-test

In this study, the writer taught the students directly. Firstly, the writer gave the students pre-test in order to measure the students' vocabulary in learning vocabulary before using picture crossword as an instructional media. In this case, the students had learnt vocabulary before. Secondly, the writer gave treatment. The writer taught the students for four times by using picture crossword. Third, there was post test. The result of pre-test and post-test was compared to look for the scores and to find out whether their abilities in learning vocabulary increase or not after picture crossword was taught. In this research, the writer collected, processed, analyzed the data to get conclusion of the research.

B. Research Design

In this study, the writer used quasi experimental design. Quasi experimental design is similar to randomized experimental research in that involves manipulation of independent variable but differ in that subjects are not randomly assigned to treatment group. There are many situations in educational research in which it is not possible to conduct a true experiment. This design is compatible with the writer's purpose who wants to evaluate the use of using picture crossword game in teaching vocabulary.

The writer used nonrandomized control group pre-test, post-test design with a kind of treatment. There are two groups in this model; control group and experimental group. Both of groups were given pre-test to measure the score of students before the treatment was given (Y₁ and Y₂). The treatment was given

for experimental group only (X). Post test was given for both of groups to measure the score of students after the treatment is given (Y1 and Y2). The scheme of this model is : ²

Table 3.1

The Scheme of Quasi Experimental Design

Subject	Pre-Test	Treatment	Post-Test
VII Aktif	Y1	X (Experiment)	Y1
VII Inovatif	Y2	Control	Y2

Where :

E : Experimental group

C : Control group

X : Treatment

Y1 : Pre-test

Y2 : Post-test

In this experiment, the writer taught the students directly with the same material. Therefore, the use of picture crossword game to teach vocabulary would be applied on experimental group only. Meanwhile, the control group would not be given the treatment.

² Donal Ary At All, Introduction to Research In Education, Eight Edition, (Canada : Wadsworth Cengage Learning, 2010), P.316.

C. Variable of The Study

Variable is a property or characteristic which may differ from individual to individual or from group to group. A great deal of research is carried out in order to identify or test the strength of relationships between variables. When one variable influences or affects a second variable, the first variable is called an independent variable, and the second is called a dependent variable. There are two variables in this study, they are:

1. Independent variable : Independent variable of this study is picture crosswords as a media in teaching vocabulary (X).
2. Dependent variable : Dependent variable of this study is the result of the student's vocabulary score who involve in this study (Y).

D. Population and Sample

a. Population

A population is defined as all members of any well defined class of people, events, or objects. If someone wants to research all of the elements in research area, his/her research is called population research on census study.³

The population of this study was all of the seventh grade students of MTsN Katingan Tengah amount 90 Students in three classes; VII Aktif, VII Kreatif and VII Inovatif.

³¹ Donald Ary, Lucy Cheser Jacobs, Chir Sorensen, Asghar Razavieh, *Introduction to Research in Education, 8th edition*, Wardsworth: USA, 2010, p.266

Table 3.2

Population of Seventh Grade Students of MTsN Katingan Tengah

Class Gender	Try Out (VII Kreatif)	Experiment (VII Aktif)	Control (VII Inovatif)
Male	11	11	12
Female	19	19	18
	30	30	30
TOTAL	90		

b. Sample

Sample is a subset of individuals or case from within a population.⁴

Sugiyono states, “*Sampel adalah sebagian dari jumlah dan karakteristik yang dimiliki oleh populasi tersebut* “. ⁵ (Sample is a half of numbers and characteristics in the population).

Cluster sampling is used if the population does not consist of individuals, but groups or cluster.⁶ Because the population of this study was the students of the seventh grade students of MTsN Katingan Tengah. Which they consist of three classes. The VII Aktif class became the experiment class and VII Inovatif became the control class.

³²David Nunan, *Research Methods in Language Learning*, Cambridge: Cambridge University Press, 1992, p. 232

⁵ *Ibid.*, p. 118

⁶Nurul Zurich, *Metodologi Penelitian Sosial dan Pendidikan (TeoriAplikasi)*, Jakarta: BumiAksara, 2006, p. 124

E. Research Instruments

1. Research Instruments

The writer collected the main data from pre-test and post-test. From the two test the writer was able to find out the students' vocabulary scores. A pre-test was given to the experiment group and control group before any teaching conducted. By giving this pre-test, the writer wanted to find out how balance these groups to each other in vocabulary, and also to compare its score to the posttest scores which would be given after the treatment. A post-test as the last test also given to both groups to get the quantitative data.

The writer collected the data of this study by using test and the result of the test was used to measure the students' vocabulary scores. The test will be in multiple choice test form and there were 30 items. The allocated time to do each vocabulary test were 90 minutes.

For the test type, the writer used the opinion from J.B Heaton. He stated that many types of test that could be used to test vocabulary. The writer took type 1 as reference.⁷

In these type of recognition items is replaced by picture. The testes see the picture and have to select the most appropriate word.

Example :

⁷ J. B. Heaton, *English Language Test*, San Francisco: Longman, 1974, p. x.

1. In the class Ani sit on...?

- a. Table
- b. Chair
- c. Book
- d. Window



2. “Tas” in English is...?

- a. Shoes
- b. Bag
- c. Shoes
- d. Table



3. “t-e-b-l-a”

The correct word is...?

- a. Table
- b. Chair
- c. Pencil
- d. Teacher



2. Research Instruments Try Out

In order to prove the test was suitable to the students who were the sample of this study, the writer conducted a try out test. Then, the writer chosed the students in the same school but different class to try out the test. VII Kreatif was as the try out class with 30 students. The test was students' vocabulary score in multiple choice test form and there are 50 items. The

result of the try out test was there were 13 items was invalid and there were 37 items was valid. The researcher used 30 items to give the pre-test.

3. Research Instrument Validity

a. Content Validity

According to Heaton, a good test should posses' validity: that is it should measure what is intended to measure and nothing else.⁸ If a test does this, it said to be valid. All of the test must be related to what students learned. In this study the instruments are equal and proportional in their distribution as the indicators of test. The following table shows the content specification of the instrument where the item distributed to the students.

To measure the validity of the instrument, the writer was use the formulation of Product Moment by Pearson as follows:⁹

$$r_{xy} = \frac{N\Sigma XY - (\Sigma X)(\Sigma Y)}{\sqrt{\{N\Sigma X^2 - (\Sigma X)^2\}\{N\Sigma Y^2 - (\Sigma Y)^2\}}}$$

Where:

r_{xy} : Total coefficient of correlation

ΣX : Total Value of Score X

ΣY : Total Value of Score Y

ΣXY : Multiplication Result between Score X and Y

N : Number of students

⁸J. B. Heaton, *English Language Test*, San Francisco: Longman, 1974, p. x.

⁹Riduwan, *Metode dan teknik Menyusun Thesis*, Bandung: Alfabeta, 2007, p. 110.

To know the level of validity of instrument, the value will be interpreted based on the qualification of validity as follows:

$t_{\text{test}} > t_{\text{table}} = \text{Valid}$

$t_{\text{test}} < t_{\text{table}} = \text{Not Valid}$

Table 3.3
Criteria of Validity

Validity	Interpretation
0.800- 1.000	Very High Validity
0.600-0.799	High Validity
0.400-0.599	Fair Validity
0.200-0.399	Poor Validity
0.000-.0199	Very Poor Validity

b. Face Validity

To face validity of the test items as follows:

- a.) Vocabularies of the test was taken by the picture crossword.
- b.) Kinds of the test items consist of vocabularies.
- c.) Language is used English.
- d.) The test items are suitable with syllabus of English subject of the MTsN Katingan Tengah.

b. Construct validity

The items test was constructed based on the material given in classroom namely vocabulary. The test was multiple choice test form and there were 30 items.

4. Research Instrument Reliability

Reliability is a necessary of any good test: for to be valid at all, a test must first be reliable as a measuring instrument. The writer used formula of Kuder and Richardson to measure the reliability of the whole test¹⁰

$$r_{11} = \left(\frac{k}{k-1} \right) \times \left(1 - \frac{M(k-M)}{k.Vt} \right)$$

Where:

r_{11} = reliability of instrument

k = number of items

M = the mean score on the test for all the testers

Vt = the standard deviation of all the testers' score

The steps in determining the reliability of the test were:

- a. Making tabulating of tests scores.
- b. Measuring the mean of the testees's scores with the formula :

$$M = \frac{\sum Y}{N}$$

- c. Measuring the total variants with the formula:

$$Tt = \frac{\sum X^2 - \frac{(\sum X)^2}{N}}{N}$$

Where:

Where:

Tt = the total variants

¹⁰ Suharsimi Arikunto, *Prosedur Penelitian*, p. 108.

ΣX = the total of score

ΣX^2 = the square of score total

N = the number of testers

d. Calculated the instrument reliability using KR-21.

e. The last decision is comparing the value of Γ_{11} and Γ_r

$\Gamma_{11} > r_{\text{table}} = \text{Reliable}$

$\Gamma_{11} < r_{\text{table}} = \text{Not Reliable}$

f. To know the level of reliability of instrument, the value of Γ_{11} was interpret based on the qualification of reliability as follows:

Table 3.4
Criteria of Reliability

Reliability	Interpretation
0.800- 1.000	Very High Reliability
0.600-0.799	High Reliability
0.400-0.599	Fair Reliability
0.200-0.399	Poor Reliability
0.000-.0199	Very Poor Reliability

F. Data Collection Procedures

The writer collected the data by implementing some procedures. There were some steps in the procedures as follow :

a. The writer will observed the class

The writer will be directly did observation in the field where the place would be taken. It would be done to observe the class condition in learning

English, to know how the students' attitude while teaching learning process was going on. The observation was purposed to get specific data, they were:

1. The general description of the location of the study
 2. The syllabus and lesson plan of the school
 3. The number of class
 4. The number of students and students' name
 5. The number of English teacher
 6. The process of teaching learning English
- b. The writer gave try out test to try out class (VII creative)
 - c. The writer determined two classes from the population into experiment group (VII active) and control group (VII innovative).
 - d. The writer gave a pre-test to the experiment group (VII active) and control group (VII innovative).
 - e. The writer taught the experiment group (VII active) by using picture crossword .
 - f. The writer taught the control group (VII innovative) by using matching word.
 - g. The writer gave a post-test to experiment group (VII active) and control group (VII innovative).
 - h. The writer gave score to the main data from experiment group (VII active) and control group (VII innovative).
 - i. The writer analyzed the data that have been obtained from pre-test and post-test.

- j. The writer interpreted the analysis result. Based on the scores obtained from pre test and post test, it was analyzed by finding the mean of the students' post test score to test the hypothesis.

G. Data Analysis Procedures

The data of this study were students' vocabulary ability score. Therefore, the data were quantitative. The pretest and post-test raw score were converted into percentages. In order to analyze the data that had been collected. The mean, standard deviation and standard error of students' score becomputed for the pretest and post-test scores of the experiment and control groups. The writer used statistical t_{test} to answer the problem of the study. In Order to analyze the data, the writer did some way procedures:

1. Gave tests to the students of the seventh grade students of MTsN Katingan Tengah.
2. Collected the data of the students work sheet test result.
3. Scored the students' answers using the formula:

$$S = \frac{n}{N} \times 100$$

Where:

S= Students' score

n= number of true answere

N= number of test items

4. Tabulated the data into the distribution of frequency of score table, then find out the mean of students' score, standard deviation, and standard error of

variable X1 (Experimental group) and X2 (Control group) by using the formulas below:

a. Mean of students' score

$$\bar{X} = \frac{\sum FX_i}{n}$$

Where:

$\sum FX_i$ = total of score

n = total of the students

b. Standard deviation¹¹

$$S = \sqrt{\frac{n \sum F_{xi}^2 + (\sum F_{xi})^2}{n(n-1)}}$$

c. Standard Error¹²

$$SE_{md} = \frac{S}{\sqrt{N-1}}$$

Where:

S = Standard deviation

n_1 = the number of the experimental group

n_2 = the number of the control group

SE_{md} = Standard error

N = Number of Case

5. Normality Test

It was used to know the normality of the data that was going to be analyzed whether both groups have normal distribution or not. Chi square is used here¹³

¹¹ Riduwan, *Metode dan teknik Menyusun Thesis*, p. 351

¹² Sudjana, *Metode Statistika*, Bandung: Tarsito, p. 273.

$$X^2_{\text{observed}} = \sum_{i=1}^k \frac{(f_o - f_e)^2}{f_e}$$

Notice:

X^2_{observed} = Chi square

f_o = frequency from observation

f_e = expected frequency

Calculation result of X^2_{observed} was compared with X^2_{table} by 5% degree of significance. If X^2_{observed} was lower than X^2_{table} so the distribution list was normal.

6. Homogeneity Test

It was used to know whether experimental group and control group, that were decided, come from population that has relatively same variant or not. The formula was:¹⁴

$$X^2_{\text{observed}} = (\log 10) \times (B - \sum (dk) \log S^2_i)$$

Where: $B = (\log S^2_i) \times \sum (n_i - 1)$

Notice:

$X^2_{\text{observed}} \leq X^2_{\text{table}}$, is homogeneity.

$X^2_{\text{observed}} \geq X^2_{\text{table}}$, is not homogeneity.

If calculation result of X^2_{observed} was lower than X^2_{table} by 5% degree of significance, it meant both groups had same variant.

¹³*Ibid*, p.179.

¹⁴*Ibid*, p. 177.

7. Calculated the data by using t_{test} to test the hypothesis of the study, whether the using of picture crossword gave effect to the students' vocabulary scores or not. To examined the hypothesis, the writer used t_{test} formula as follows:¹⁵

$$t_{\text{observed}} = \frac{Mn_1 - Mn_2}{\sqrt{\frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2}{n_1 + n_2 - 2} \left(\frac{1}{n_1} + \frac{1}{n_2} \right)}}$$

Where:

Mn_1 = the mean score of experimental group

Mn_2 = the mean score of control group

S_1^2 = variance of experimental group

S_2^2 = variance of control group

n_1 = total of experimental group students

n_2 = total of control group students

To know the hypothesis was accepted or rejected using the criterion: **If t_{observed} (the value) $\geq t_{\text{table}}$, it means H_a is accepted and H_o is rejected. If t_{observed} (the value) $\leq t_{\text{table}}$, it means H_a is rejected and H_o is accepted.**

8. Interpreted the result of t_{test} . Previously, the writer accounted the degrees of freedom (df) with the formula:¹⁶

$$df = (N_1 + N_2 - 2)$$

Where:

df: degrees of freedom

N_1 : Number of subject group 1

¹⁵*Ibid*, p. 273

¹⁶Anas Sugiono, *Pengantar Statistik Pendidikan*, Jakarta: Rajawali Press, 1978, p. 284.

N2: Number of subject group 2

2: Number of variable

After that, the value of t_{test} will be consulted on the t_{table} at the level of significance 1% and 5%. In this research, the writer uses the level of significance at 5%. If the result or t_{test} was higher than t_{table} , it means H_a was accepted. But if the result of t_{test} was lower than t_{table} , it means H_o was accepted.